

PARANESIDEA AND PAPILLATABAIRDIA (CRUSTACEA,
OSTRACODA) FROM THE MIOCENE OF THE PORT
PHILLIP AND WESTERN PORT BASINS, VICTORIA,
AUSTRALIA

By M. T. WARNE

Geology Department, University of Melbourne, Parkville, Vic, 3052

ABSTRACT: Three new bairdiid ostracode species are described, *Paranesidea barwonensis*, *Paranesidea epineritica*, and "*Paranesidea*" *vadium* from the late Early to early Middle Miocene Batesford Limestone, Fyansford and Sherwood Formations, south-central Victoria. The generic allocation of the last named species under *Paranesidea* rather than *Triebelina* is discussed. Their lithostratigraphic distributions indicate a shallow water palaeoecology. In addition, the first fossil occurrence of a species of *Papillatabairdia* is noted.

During the study of the ostracode faunas from the late Early to early Middle Miocene formations within the Port Phillip and Western Port Basins (Figs 1, 2) the author found several new species belonging to the genus *Paranesidea* Maddocks, 1969. These, together with the restricted occurrence of species belonging to *Bairdopilata*, make up a small, conspicuous element within the *Neonesidea*-dominated bairdiid ostracode faunas abundant in the Batesford Limestone and shallower water facies of the Fyansford and Sherwood Formations.

Paranesidea barwonensis sp. nov., although common in the Batesford Limestone, occurs more abundantly in the conformable Fyansford Clay outcropping below the limit of *Lepidocyclus* in the Batesford Limestone Quarry (22 specimens). The Fyansford Clay below the upper limit of *Lepidocyclus* is transitional in lithology and depth of deposition between the very shallow water Batesford Limestone and other deeper, inner to mid-shelf (?) units of the Fyansford Clay, such as occurring above the upper limit of *Lepidocyclus* (Bowler 1963). *Paranesidea barwonensis* is significantly less abundant in these deeper water depositional units, but the presence of adults together with late and early stage instars suggests that it is also part of the biocenosis in the Fyansford Clay above the upper limit of *Lepidocyclus*. Two adult specimens were found within the outer shelf to epibathyal Balcombe Clay, the deepest water facies of the Fyansford Formation, at Manyung Rocks near Mornington, but because of a lack of juveniles they are here assumed to be part of the thanatocenosis. Specimens are also common in the Flinders Limestone, considered to be part of the Sherwood Formation, outcropping on the coast near Flinders, Victoria. Conformable with the Flinders Limestone is the broadly termed Sherwood Marl, this being the other lithostratigraphic component of the Sherwood Formation. Although the Sherwood Marl contains an abundant ostracod fauna, no specimens of *Paranesidea barwonensis* were recovered.

Paranesidea epineritica sp. nov. is rare in comparison to *Paranesidea barwonensis*. However, adults and mainly late stage instars were found in the Batesford

and Flinders Limestones (10 specimens) and only juveniles in both the shallow and deeper water depositional units of the Fyansford Clay. "*Paranesidea*" *vadium* sp. nov. is most abundant in the Batesford Limestone (14 specimens), but is also common within the transitional shallow water units of the Fyansford Clay outcropping below the upper limit of *Lepidocyclus* in the Batesford Limestone Quarry and is very rare in the deeper water units outcropping above the upper limit of *Lepidocyclus*. It is conspicuous in the Flinders Limestone, but rare in the Sherwood Marl. No early stage instars have been found although all the localities yield both adult and late stage instars excepting those of the Sherwood Marl where only single adult specimens have been found. The lack of early stage instars may be because this species is small, and also because specimens are generally found in the high energy shallow water facies. It is therefore inferred that early stage earpaece once shed, and no longer stabilized by the biological activity and weight of the living animal, were easily transported and/or destroyed. However, van den Bold (1974) in noting the rarity of early *Triebelina* moults (some species closely resembling this new "paranesidean" form) suggested they were indistinguishable from the early moults of some non-ornate bairdiids. No specimens were found in the Balcombe Clay, this outer shelf to epibathyal facies representing a depth of deposition which was spatially far removed from the environments containing these essentially shallow water forms.

One single (juvenile?) right valve of a *Papillatabairdia* species was recovered from the Middle Miocene of the Sherwood Marl. This species closely resembles the Recent species described by Bentley (1981), *Papillatabairdia dentata* and previously referred to as *Bythocypris* sp. (Hartmann-Schroeder & Hartmann 1978).

The presence of species from these two genera within the Victorian late Early to early Middle Miocene is an accord with the tropical to subtropical climatic affinities of the ostracode assemblages described for this period of deposition (McKenzie 1974, Whatley & Downing 1983, McKenzie & Peypouquet 1984).

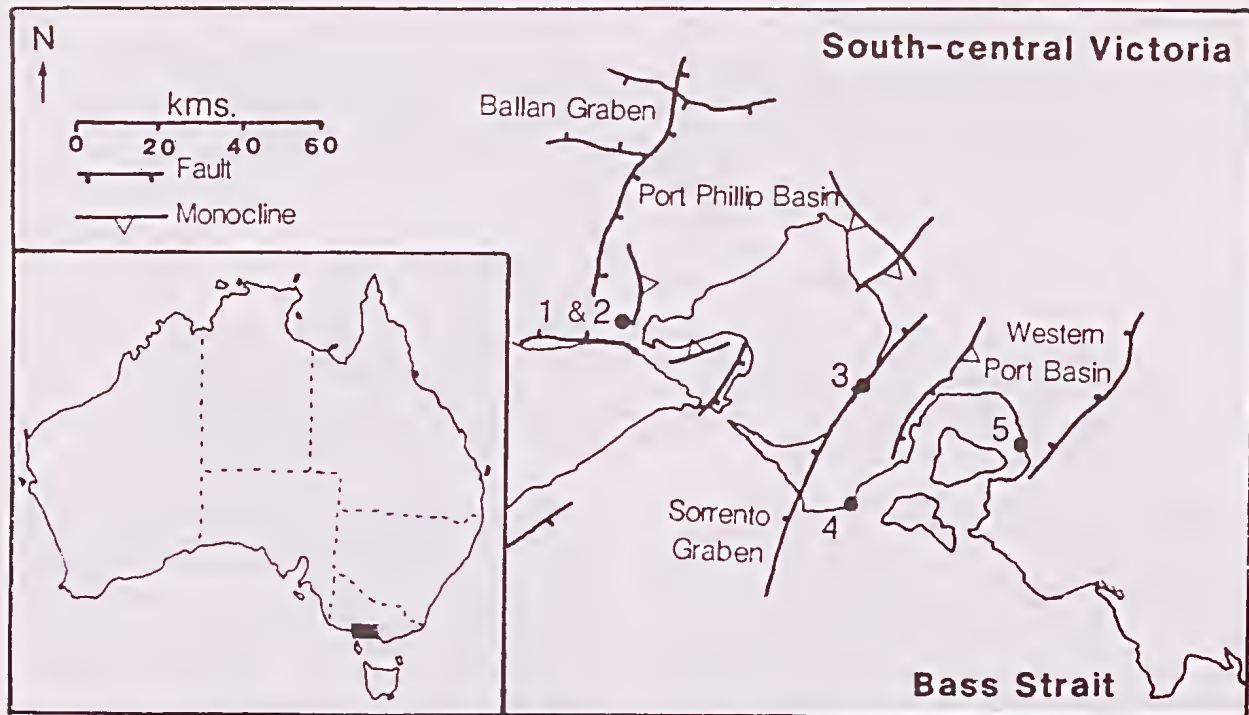


Fig. 1—Map showing sample localities. 1, 2, Batesford Limestone Quarry. 3, Manyung Rocks, Morn-
 ington. 4, Flinders. 5, Victorian Geological Survey Borehole "Lang Lang 28".

The new species of "*Paranesidea*" *vadum* displays carapace characters that are taxonomically transitional between the two genera *Paranesidea* and *Triebelina*. Its generic allocation is therefore provisional. This problem is commonly encountered in bairdiid species as noted by van den Bold (1974), and highlights the difficulty in distinguishing generically forms which display carapace features that change gradually between genera and may not completely correlate with variations in the soft part anatomy of modern species of these genera.

The conventions RV = right valve, LV = left valve, L = length, H = height, W = width are used throughout. Type specimens are housed in the F. A. Singleton Museum of the Geology Department at the University of Melbourne under the registered numbers MUGDFS 4164-MUGDFS 4179. Outcrop samples were approximately 0.5 kg dry weight.

SYSTEMATIC PALAEOONTOLOGY

Family BAIRDIIDAE Sars, 1888
 Genus *Paranesidea* Maddocks, 1969
Paranesidea barwonensis sp. nov.
 Figs 3 A-I, 4 A-B

ETYMOLOGY: The type locality is near the Barwon River, Fyansford, Victoria.

MATERIAL: Seventy, both adult and juvenile, specimens from the Batesford Limestone, Fyansford and Sherwood Formations, Victoria.

DIAGNOSIS: Characterised by its short carapace, weak caudal extension and spinose anterior and posterior

margins on both left and right valves.

DESCRIPTION: Carapace robust, coarsely punctate, inflated, rotund, and moderately small for family. LV larger than RV and overlapping it. LV with symmetrical rounded anterior, straight anterodorsal and convex anteroventral slope; extremity at mid-height. Posteriorly LV with convex posterodorsal slope and weakly developed caudal extension well below mid-height. Anteriorly RV with straight anterodorsal slope and straight to slightly convex anteroventral slope. Posteriorly RV with straight posterodorsal slope, short convex posteroventral slope and caudal extension below mid-height. Dorsal margin highly arched in LV, less so in RV. Maximum height at mid-length; maximum length just below mid-height; maximum width distinctly ventral. Normal pore canals simple without rims, large and numerous. Inner lamellae moderately broad, inner margin more rounded than outer margin; vestibulum narrow; marginal pore canals simple, straight and numerous. Selvage prominent and sinuous ventrally. Hinge lophodont in adults; adont in juveniles. Anterior and posterior margins denticulate in both valves. Adductor muscle sears comprising eight to nine, occasionally divided, subrounded to elongate sears in an overall subrounded pattern. Sexual dimorphism pronounced with males being more elongate and less inflated in the ventral region than females.

DIMENSIONS: Holotype, male, MUGDFS 4164, L=0.74 mm, H=0.47 mm, W=0.43 mm. Paratype, LV, female, MUGDFS 4165, L=0.76 mm, H=0.49 mm. Paratype, RV, male, MUGDFS 4166,

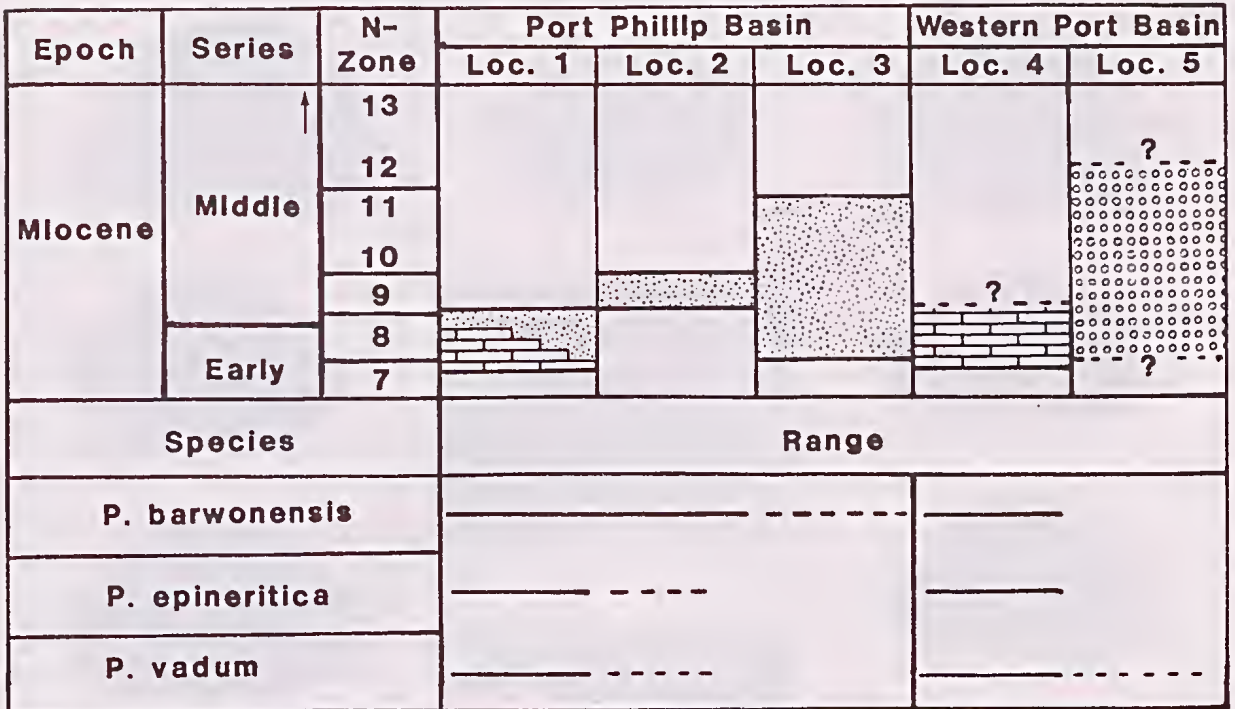


Fig. 2—Correlation of stratigraphic units sampled in the Port Phillip and Western Port Basins and species ranges (box pattern=limestone; dots=marl or clay; open circles=calcareous sand; solid line=autochthonous; dashed line=allochthonous or uncertain). Loc. 1, Batesford Limestone and shallow water transitional units of Fyansford Clay (Fyansford Formation), below upper limit of *Lepidocyclus*, in the south-west face of the Batesford Limestone Quarry. Loc. 2, Deep water units of Fyansford Clay (Fyansford Formation) above upper limit of *Lepidocyclus* in the south-west face of the Batesford Limestone Quarry. Loc. 3, Balcombe Clay (Fyansford Formation) near Mornington. Loc. 4, Flinders Limestone (Sherwood Formation) near Flinders. Loc. 5, Sherwood Marl (Sherwood Formation) subsurface in the Victorian Geological Survey Borehole "Lang Lang 28".

L=0.68 mm, H=0.35 mm. Paratype, RV, female, MUGDFS 4167, L=0.74 mm, H=0.40 mm. Paratype, LV, female, MUGDFS 4168, L=0.75 mm, H=0.45 mm. Paratype, LV, male, MUGDFS 4169, L=0.73 mm, H=0.42 mm.

TYPE LOCALITY: Fyansford Clay in the Batesford Limestone Quarry near the base of the formation at this location (below upper limit of *Lepidocyclus*), one metre vertically above the contact with the Batesford Limestone, south-west face, near Fyansford, Victoria, 38°06'S, 144°17'E.

REMARKS: This species differs from many *Paranesidea* species in that it has a spinose rather than a frilled RV. *Paranesidea? albatrossa* Maddocks, 1969 has a smooth shell surface and almost straight ventral margin in RV. *Paranesidea hians* Malz, 1981 is unlike the new species in overall shape and position of maximum width. The new species has a significantly more sinuous anterior margin. *Paranesidea onslowensis* Hartmann-Schroeder and Hartmann, 1978 has a more strongly caudate LV, a frilled RV, and apparently lacks LV marginal spines. *Paranesidea attenuata* (Brady 1880) is more elongate and caudate. The new species is also present in the marly facies of the Muddy Creek Miocene, near Hamilton, Victoria (personal communication J. V. Neil 26-7-85).

GEOLOGICAL AGE: Batesfordian to Balcombian (N8-9), late Early to early Middle Miocene.

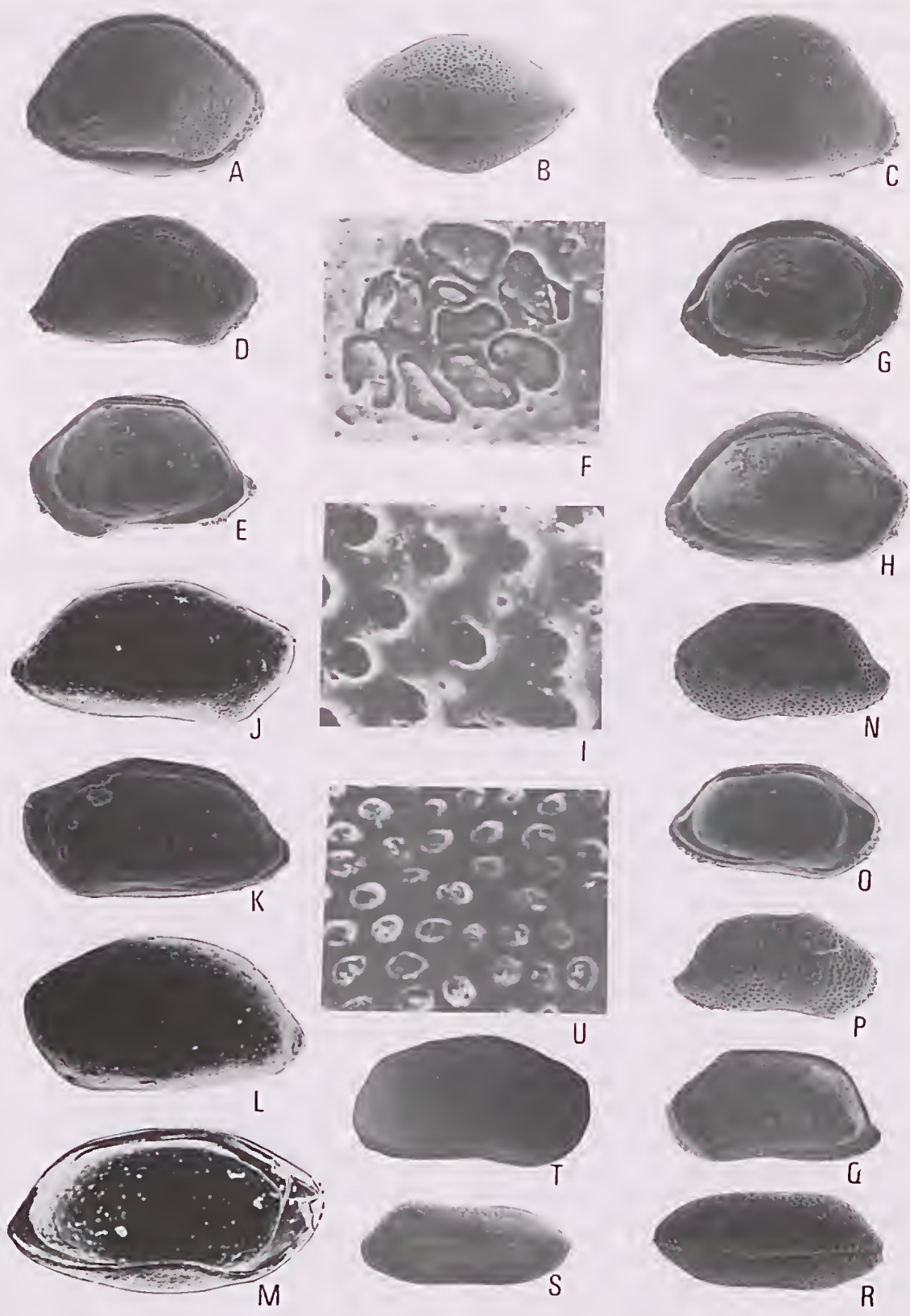
Paranesidea epineritica sp. nov.
Figs 3 J-M, 4 C-D

ETYMOLOGY: From epineritic—a reference to the presumed shallow water habitat of the species.

MATERIAL: Eight adult and six juvenile valves from the Batesford Limestone, Fyansford and Sherwood Formations, Victoria.

DIAGNOSIS: Characterised by its unusually elongate and narrow carapace.

DESCRIPTION: Thick shelled carapace of moderate size, elongate; ventral region slightly inflated; finely punctate. LV larger than RV and overlapping it. LV with asymmetrically rounded anterior, straight to slightly concave anterodorsal slope and convex anteroventral slope; extremity above mid-height. Posteriorly LV with slightly concave posterodorsal slope, very short convex posteroventral slope and weakly developed caudal extension well below mid-height. RV with asymmetrically rounded anterior, but narrower than in LV with straight to slightly concave anterodorsal slope, convex anteroventral slope; extremity at mid-height. Posteriorly



RV with convex posterodorsal slope; short convex posteroventral slope and caudal extension below mid-height. Dorsal margin straight in RV, gently arched in LV. Ventral margin straight in LV, slightly indented in RV. Maximum length above mid-height in LV; approximately at mid-height in RV. Maximum height anterior of mid-length. Maximum width distinctly ventral. Normal pore canals simple without rims, large and numerous. Inner lamellae of moderate size, inner margin subparallel to outer margin; vestibulum distinct, larger in the anterior than in the posterior. Marginal pore canals simple, straight and numerous. Selvage prominent and straight to gently sinuous in ventral region. Overall marginal denticulation is quite variable, occurring on the posteroventral and anteroventral slopes of both valves. Spines on well preserved juvenile specimens are generally long, pointed and fragile while those on adults are short, broad, rounded and more robust. Hinge lophodont in adults; adont in juveniles. Adductor muscle scars below mid-height and slightly anterior of mid-length comprising eight to nine subrounded to wedge-shape scars in a subrounded aggregate. Sexual dimorphism slight with males being more elongate than females which have a more rounded dorsal margin.

DIMENSIONS: Holotype, RV, female, MUGDFS 4170, L=0.85 mm, H=0.35 mm. Paratype, RV, juvenile?, MUGDFS 4171, L=0.80 mm, H=0.33 mm. Paratype, LV, juvenile?, MUGDFS 4172, L=0.80 mm, H=0.34 mm. Paratype, LV, female, MUGDFS 4173, L=0.85 mm, H=0.37 mm.

TYPE LOCALITY: Batesford Limestone in Batesford Limestone Quarry one metre above base of Quarry, south-west face, near Fyansford, Victoria, 38°06'S, 144°17'E.

REMARKS: The marginal spinosity in this taxon is variable and sometimes absent. Absence is probably an effect of taphonomy, but variation in the degree of spinosity possibly correlates with physiological and environmental factors.

Intraspecific variation of marginal denticulation in the genus has been previously noted by van den Bold

(1974). *P. epimeritica* is unlike *P. barwonensis* which is less elongate and more coarsely punctate, and differs from the superficially similar figured but undescribed *Bairdia* sp. 179 (Hartmann 1981) in outline and marginal ornament. This new species is also present in the marly facies of the Muddy Creek Miocene, Hamilton, Victoria (personal communication J. V. Neil 26-7-85). Two juvenile? specimens from the Fyansford Clay (from type locality of *P. barwonensis*) are included as paratypes as these demonstrate the punctate ornament not shown by the abraded adults from limestone facies.

GEOLOGICAL AGE: Batesfordian to Balcombian (N8-9), late Early to early Middle Miocene.

"Paranesidea" vadum sp. nov.

Figs 3 N-S, 4 E-F, H-M

ETYMOLOGY: Vadum (Latin)—shallow water, a reference to the presumed shallow water habitat of the species.

MATERIAL: Twenty-eight adults and late stage juveniles from the Batesford Limestone, Fyansford and Sherwood Formations.

DIAGNOSIS: Characterised by a trapezoidal shape (subquadrate) but without distinct ridges or swellings on lateral surface.

DESCRIPTION: Carapace small, very robust, coarsely punctate, almost equivalved and subquadrate in lateral outline. LV slightly larger than RV. LV with acutely rounded anterior, straight anterodorsal slope and convex anteroventral slope, extremity at mid-height. Posteriorly LV with posterodorsal slope concave, posteroventral slope convex and caudal extension below mid-height. Dorsal margin straight, ventral margin concave. RV similar in outline to LV excepting it is more elongate, more caudate, and has a pronounced indentation of the ventral margin. Maximum length slightly below mid-height; maximum height at mid-length, maximum width below mid-height in ventral region and approximately equal to the width of the carapace in the slightly swollen posterodorsal region of the LV (see below).

Fig. 3—A, *Paranesidea barwonensis* sp. nov., male, lateral view of entire carapace, ×54, MUGDFS 4164 (Holotype). B, *Paranesidea barwonensis* sp. nov., male, dorsal view of entire carapace, ×51, MUGDFS 4164 (Holotype). C, *Paranesidea barwonensis* sp. nov., female, external LV, ×50, MUGDFS 4165 (Paratype). D, *Paranesidea barwonensis* sp. nov., male, external RV, ×54, MUGDFS 4166 (Paratype). E, *Paranesidea barwonensis* sp. nov., female, internal RV, ×51, MUGDFS 4167 (Paratype). F, *Paranesidea barwonensis* sp. nov., male, muscle scar RV, ×210, MUGDFS 4166 (Paratype). G, *Paranesidea barwonensis* sp. nov., female, internal LV, ×48, MUGDFS 4168 (Paratype). H, *Paranesidea barwonensis* sp. nov., male, internal LV, ×52, MUGDFS 4169 (Paratype). I, *Paranesidea barwonensis* sp. nov., female, surface ornament and normal pore canals LV, ×450, MUGDFS 4165 (Paratype). J, *Paranesidea epimeritica* sp. nov., external RV juvenile?, ×53, MUGDFS 4171 (Paratype). K, *Paranesidea epimeritica* sp. nov., female, internal RV, ×49, MUGDFS 4170 (Holotype). L, *Paranesidea epimeritica* sp. nov., external LV juvenile?, ×55, MUGDFS 4172 (Paratype). M, *Paranesidea epimeritica* sp. nov., female, internal LV, ×55, MUGDFS 4173 (Paratype). N, "*Paranesidea*" *vadum* sp. nov., female, external LV, ×49, MUGDFS 4175 (Paratype). O, "*Paranesidea*" *vadum* sp. nov., male, internal LV, ×50, MUGDFS 4176 (Paratype). P, "*Paranesidea*" *vadum* sp. nov., male, external RV, ×48, MUGDFS 4177 (Paratype). Q, "*Paranesidea*" *vadum* sp. nov., female, internal RV, ×48, MUGDFS 4178 (Paratype). R, "*Paranesidea*" *vadum* sp. nov., male, ventral view of entire carapace, ×56, MUGDFS 4174 (Holotype). S, "*Paranesidea*" *vadum* sp. nov., male, dorsal view of entire carapace, ×50, MUGDFS 4174 (Holotype). T, *Papillatabairdia* sp. cf. *dentata* external RV, ×70, MUGDFS 4179. U, *Papillatabairdia* sp. cf. *dentata*, surface ornament RV, ×700, MUGDFS 4179.

The ventral region of both valves is longitudinally but indistinctly swollen with slight increases in degree posteroventrally and anteroventrally, the former being greater than the latter. No distinct ventrolateral carina is developed. Slight posterodorsal swelling present; greater in LV than RV. Lateral surface region anterior of posterodorsal swelling is very greatly depressed in some specimens from the mid-dorsum down to mid-length of ventrolateral swelling. This ornamental feature (depression) is only visible in dorsal and ventral perspectives of adult males, adult females being also inflated in the mid-carapace region, hence obscuring the very subtle undulations present in the male. Inner lamellae large in relation to overall size; inner margin subparallel to outer margin; vestibule narrow. Marginal pore canals simple without rims, large and numerous. Selvage prominent and sinuous ventrally. Hinge lophodont in adults; adont in juveniles. Stout spines on the posteroventral and anteroventral margins of both valves. Adductor muscle scar complex consisting of eight to nine occasionally divided, subrounded to elongate scars in a subcircular aggregate. Presumed sexual dimorphism slight but detectable, in that the females tend to be higher, have a steeper posterodorsal slope and are slightly more swollen in the mid-carapace region than the males, which are relatively more elongate.

DIMENSIONS: Holotype, male, MUGDFS 4174, L=0.65 mm, H=0.35 mm, W=0.27 mm. Paratype, LV, female, MUGDFS 4175, L=0.66 mm, H=0.36 mm. Paratype, LV, male, MUGDFS 4176, L=0.65 mm, H=0.35 mm. Paratype, RV, male, MUGDFS 4177, L=0.64 mm, H=0.29 mm. Paratype, RV, female, MUGDFS 4178, L=0.66 mm, H=0.31 mm.

TYPE LOCALITY: Fyansford Clay in Batesford Limestone Quarry, near the base of the formation at this location (below upper limit of *Lepidocyclina*), one metre vertically above the contact with the Batesford Limestone, south-west face, near Fyansford, Victoria, 38°06'S, 144°17'E.

REMARKS: This species differs from *Paranesidea* sp. (van den Bold 1974) which has a gently arched dorsal margin and is less caudate. It is unlike *Bairdia* sp. (Allison & Holden 1971) which is more elongate, less caudate and has an evenly rounded lateral surface. *Paranesidea parva* Hartmann-Schroeder and Hartmann, 1978 differs in having among other distinctive features, a higher posterior extremity and a more rotund shape. In general, this new taxon contrasts with species belonging to the genus *Triebelina* originally described by van den Bold (1946) because these have a stronger surface ornament often with a distinct ventrolateral carina. However, the subtly developed undulations and swellings on the male carapace of the new species perhaps tend towards the surface ornament of some *Triebelina* species such as *Triebelina boldi* Keij. Significantly one cluster of *Triebelina* species (Keij 1974) having relatively long carapaces and weakly or only partially developed ventrolateral carinae, and including *T. boldi* as well as *T. reticulopunctata*, *T. howei*, *T. crumena* and *T. bradyi*,

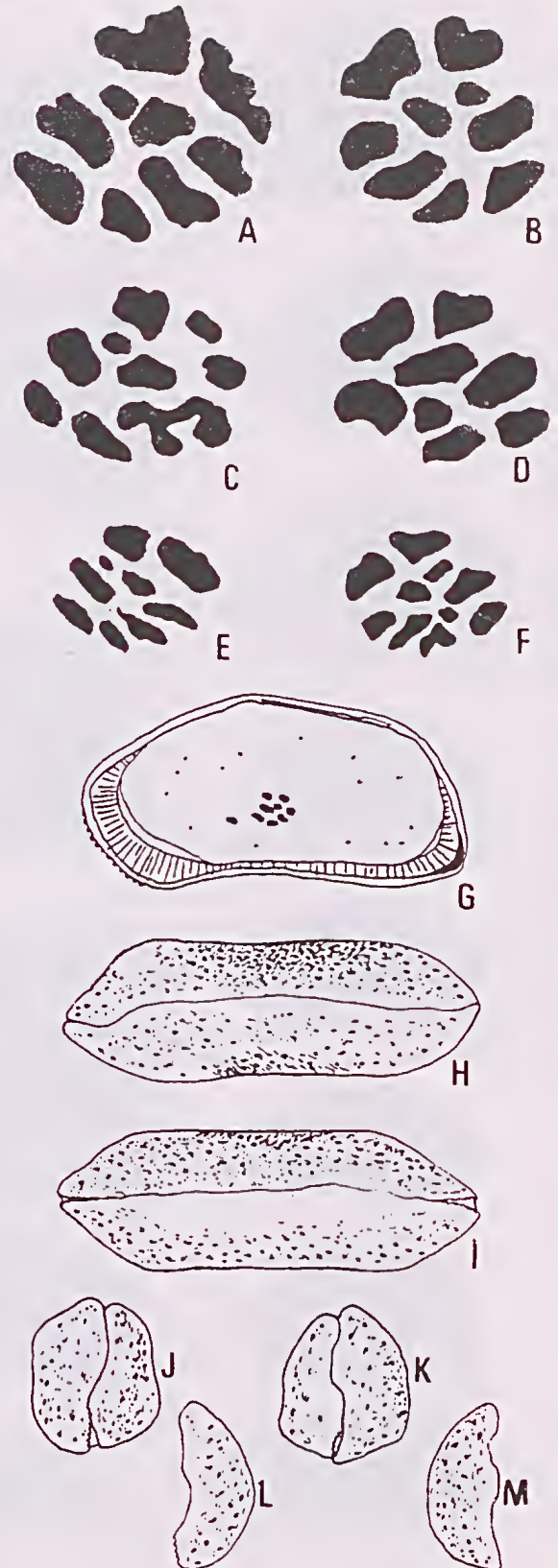


Fig. 4—A, *Paranesidea barwonensis* sp. nov., RV muscle scar, $\times 200$, MUGDFS 4167 (Paratype). B, *Paranesidea barwonensis* sp. nov., LV muscle scar, $\times 200$, MUGDFS 4169 (Paratype). C, *Paranesidea epineritica* sp. nov., RV muscle scar, $\times 205$, MUGDFS 4170 (Holotype). D, *Paranesidea epineritica* sp. nov., LV muscle scar, $\times 205$, MUGDFS 4173 (Paratype). E, "*Paranesidea*" *vadum* sp. nov., RV muscle scar, $\times 195$, MUGDFS 4178 (Paratype). F, "*Paranesidea*" *vadum* sp. nov., LV muscle scar, $\times 195$, MUGDFS 4176 (Paratype). G, *Papillatabairdia* sp. cf., *dentata*, internal RV, $\times 98$, MUGDFS 4179. H, "*Paranesidea*" *vadum* sp. nov., dorsal, male, $\times 86$, MUGDFS 4174 (Holotype). I, "*Paranesidea*" *vadum* sp. nov., ventral, male, $\times 86$, MUGDFS 4174 (Holotype). J, "*Paranesidea*" *vadum* sp. nov., posterior, male, $\times 65$, MUGDFS 4174 (Holotype). K, "*Paranesidea*" *vadum* sp. nov., anterior, male, $\times 65$, MUGDFS 4174 (Holotype). L, "*Paranesidea*" *vadum* sp. nov., posterior, female, RV, $\times 67$, MUGDFS 4178 (Paratype). M, "*Paranesidea*" *vadum* sp. nov., anterior, female, RV, $\times 67$, MUGDFS 4178 (Paratype).

were considered by Keij to be the closest morphological group to *Paranesidea*. Furthermore, the very small robust carapace of this new species together with its sub-square outline is more akin to taxa belonging to *Triebelina* than to *Paranesidea*, especially in the context of Maddocks' (1969) definitions. Nevertheless, the viewpoint of van den Bold (1974), in which he questioned the significance of, and therefore altered the emphasis on, diagnostic triebelinan features, is accepted in this paper. Van den Bold concluded that only those forms with distinct ridges and swellings should be allocated to *Triebelina*. This new species is therefore placed under *Paranesidea*, although morphologically transitional towards *Triebelina*. The recorded biostratigraphic distribution of strongly ornamented Indo-Pacific bairdiids (i.e. *Triebelina sensu* van den Bold and Keij) begins in the Late Miocene indicated by *T. sertata* from the Philippines and *T. bradyi* from the Fijian Islands (Keij 1973). Although earlier occurrences have been documented outside this region (Keij 1974), it is not until post-Middle Miocene times that distinct *Triebelina* forms become evident within the Indo-Pacific region. The placement of this new Middle Miocene species under *Paranesidea* therefore accords with the stratigraphic framework. The general trend towards increasing distribution upsequence of heavily ornate bairdiids such as *Triebelina* in the region is also reflected in the records of *Havanardia* and *Pterobairdia* (Keij 1973, 1976, McKenzie & Keij 1977).

This new species is also present in the marly facies of the Muddy Creek Miocene, Hamilton, Victoria (personal communication J. V. Neil 26-7-85).

GEOLOGICAL AGE: Batesfordian to Balcombian (N8-9), late Early to early Middle Miocene.

Genus *Papillatabairdia* Bentley, 1981

Papillatabairdia sp. cf. *dentata* Bentley, 1981

Figs 3 T-U, 4 G.

MATERIAL: One RV from the Middle Miocene Sherwood Formation (marly facies) in the Geological Survey of Victoria borehole "Lang Lang" 28 between the intervals 72 and 74 metres from the surface.

DIMENSIONS: RV, juvenile? MUGDFS 4179, L=0.53 mm, H=0.29 mm.

REMARKS: Small reasonably thick shelled papillate form with a truncated posterior. Differs from *Papillatabairdia dentata* Bentley, 1981 in being smaller, more elongate, having a less rounded posterior, higher anterior extremi-

ty and greater cardinal angle between the dorsal and anterodorsal margins. The significance of these differences may be no more than an indication of juvenility.

GEOLOGICAL AGE: Middle Miocene.

ACKNOWLEDGEMENTS

I thank Dr. G. A. Thomas from the University of Melbourne and Dr. K. G. McKenzie from the Riverina-Murray Institute of Higher Education for their guidance and useful discussion. The Museum of Victoria is thanked for access to their ostracode collection as is the Geological Survey of Victoria for their borehole material.

I also acknowledge financial assistance from the Commonwealth Postgraduate Research Award Scheme; and the Department of Geology at the University of Melbourne for the use of facilities.

REFERENCES

- ALLISON, E. C. & HOLDEN, J. C., 1971. Recent ostracodes from Clipperton Island, Eastern Tropical Pacific. *San Diego Soc. Nat. Hist. Trans.* 16(7): 165-214.
- BENTLEY, C., 1981. *Papillatabairdia*, a new ostracod genus from Brisbane Water, New South Wales. *Journ. and Proc. Roy. Soc. N.S.W.* 114: 59-61.
- BOLD, W. A. VAN DEN, 1946. Contribution to the study of Ostracoda, with special reference to the Tertiary and Cretaceous microfauna of the Caribbean region. Amsterdam, Debussy, 167 pp.
- BOLD, W. A. VAN DEN, 1974. Ornate Bairdiidae in the Caribbean. *Geoscience and Man* 6: 29-40.
- BOWLER, J. M., 1963. Tertiary stratigraphy and sedimentation in the Geelong-Maude area, Victoria. *Proc. Roy. Soc. Vict.* 76: 69-137.
- BRADY, G. S., 1880. Report on the Ostracoda dredged by H.M.S. Challenger during the years 1873-1876. *Reports of the voyage of H.M.S. Challenger, Zoology* 1(3): 1-184.
- HARTMANN, G., 1981. Die Ostracoden der Ordnung Podocopida G. W. Muller 1894 der subtropischen Ostküste Australiens (zwischen Eden im Süden und Heron Island im Norden). *Mitt. Hamb. Zool. Mus. und Inst.* 78: 97-149.
- HARTMANN-SCHROEDER, G. & HARTMANN, G., 1978. Zur Kenntnis des Eulitorals der australischen Küsten unter besonderer Berücksichtigung der Polychaeten und Ostracoden. *Mitt. Hamb. Zool. Mus. und Inst.* 75: 63-219.

- HAZEL, J. E. & HOLDEN, J. C., 1971. Ostracoda of Late Eocene age from Eua, Tonga. *U.S. Geological Survey Professional Paper* 640-D: 1-11.
- KEIJ, A. J., 1973. Recent West African *Havanardia* species (Ostracoda). *Proc. Kon. Ned. Akad. Wetensch., ser. B* 76(4): 316-328.
- KEIJ, A. J., 1974. Review of the Indo-Pacific species of *Triebelina* (Ostracoda). *Proc. Kon. Ned. Akad. Wetensch., ser. B* 77(4): 345-358.
- KEIJ, A. J., 1976. Note on *Havanardia* and *Triebelina* species (Ostracoda). *Proc. Kon. Ned. Akad. Wetensch., ser. B* 79(1): 36-44.
- MADDOCKS, R. F., 1969. Revision of Recent Bairdiidae. *U.S. Nat. Mus. Bull.* 295: 1-126.
- MALZ, H., 1981. Palaeozoic Ostracoden von den Emperor Seamounts, N. W. Pazific. *Zitteliana* 7: 3-29.
- MCKENZIE, K. J., 1974. Cenozoic Ostracoda of southeastern Australia, with the descriptions of *Hanaiceratina*, new genus. *Geoscience and Man* 6: 153-182.
- MCKENZIE, K. J. & KEIJ, A. J., 1977. *Pterobairdia* (Ostracoda, Bairdiidae), a new genus from the Indo-West Pacific. *Proc. Kon. Ned. Akad. Wetensch., ser. B* 80(5): 367-374.
- MCKENZIE, K. J. & PEYPOUQUET, J. P., 1984. Oceanic palaeoenvironment of the Miocene Fyansford Formation from Fossil Beach near Mornington, Victoria, interpreted on the basis of Ostracoda. *Alcheringa* 8/4: 291-303.
- WHATLEY, R. & DOWNING, S., 1983. Middle Miocene Ostracoda from Victoria, Australia. *Rev. espanol. Micropaleont.* 15: 347-407.